Drinking Water Safety in Newfoundland and Labrador

Annual Report 2013

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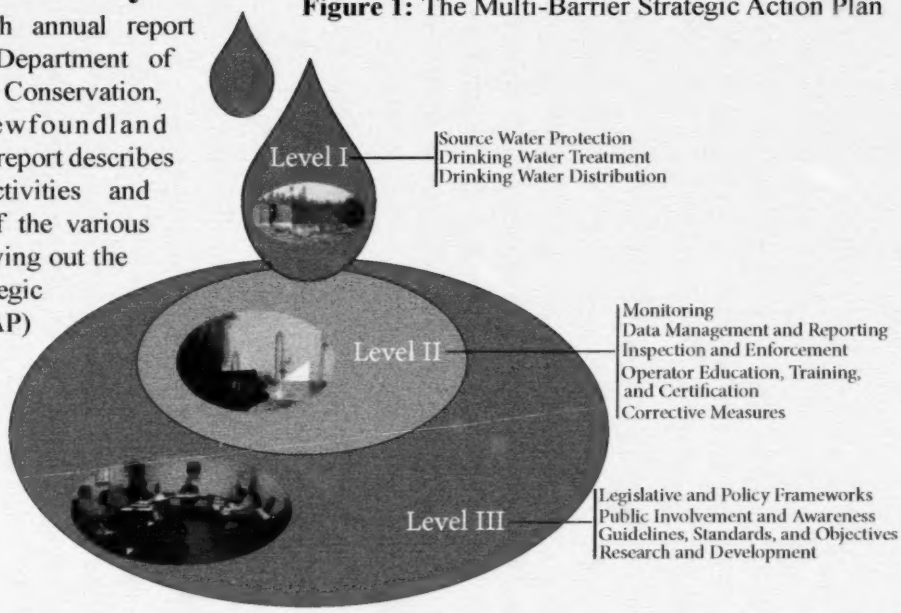
Executive Summary

This is the twelfth annual report prepared by the Department of Environment and Conservation, Government of Newfoundland and Labrador. This report describes the initiatives, activities and accomplishments of the various departments in carrying out the Multi-Barrier Strategic Action Plan (MBSAP) for the 2012–13 fiscal year. The MBSAP adopted by Newfoundland and Labrador is illustrated in Figure 1.

Figure 1: The Multi-Barrier Strategic Action Plan



Highlights of MBSAP component indicators for the 2012–13 fiscal year include:

- 315 protected public water supply areas in the province
- 236 land use referrals reviewed for proposed activities concerning protected public water supply areas
- 5 watershed management committees
- 510 disinfection systems and 109 drinking water treatment systems
- $30,245,000 approved by the Department of Municipal and Intergovernmental Affairs for water infrastructure projects
- 174 permits to construct for water and sewer infrastructure
- 315 active permits to operate water distribution systems, 13 active permits to operate water treatment systems
- 219 active boil water advisories as of March 31, 2013
- 19,121 bacteriological samples and 3,779 chemical and physical water quality samples were collected
- Bacteriological and chemical drinking water quality exceedances (Table 11)
- 1,286 community drinking water quality reports published
- 75 regulatory inspections performed
- 34 education and 211 on - site training seminars conducted by ENVC
- 376 certified water and/or wastewater system operators in the province
- 322 participants at the 2013 Annual Drinking Water Safety Workshop
- Corrective measures undertaken (Table 16)
- *Watershed Sensitivity Classification System*

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Introduction

This is the twelfth annual report prepared by the Department of Environment and Conservation (ENVC). This report highlights the initiatives, activities, and accomplishments of the departments that implemented the Multi-Barrier Strategic Action Plan (MBSAP) in the 2012–13 fiscal year (April 1, 2012 to March 31, 2013). The report describes the three levels of the MBSAP and their various components. It illustrates how Government is implementing the MBSAP, describes the intended path forward, and plans for future implementation of the MBSAP.

The MBSAP is considered to be the most effective method of managing drinking water systems and has been implemented by other jurisdictions throughout Canada.

The implementation of the MBSAP involves the collaborative efforts of four provincial government departments:

1. Environment and Conservation (acting as the lead agency)
2. Health and Community Services
3. Municipal and Intergovernmental Affairs
4. Service NL

In this report, indicators are reported for various components of the MBSAP. Information is reported for the current fiscal year alongside of previous fiscal years, to evaluate performance of the existing drinking water framework. In addition, illustrations of technical work related to drinking water in this province are highlighted.

Permit to Operate - Drinking Water System Inspections

The Permit to Operate Drinking Water System Inspection Program was initiated in 2012. The inspection involves a detailed audit of operation and maintenance practices using a form that has up to 85 questions covering topics such as:

1. source protection
2. treatment system
3. water quality and quantity monitoring
4. waste and process wastewater
5. distribution system
6. operations manuals
7. logbooks
8. contingency, emergency and long-term planning
9. security and safety
10. consumer relations
11. reporting, notification and corrective actions
12. operator certification and training

All questions relate to requirements found in the Permit to Operate. Seven communities have been inspected to date, all with water treatment plants. A Drinking Water System Inspection Report is sent to the town after the inspection is completed, highlighting issues of non-compliance and recommended corrective actions. A revised Permit to Operate for the Drinking Water System (water treatment and water distribution, as applicable) will be issued to the town.

Over the next five years, the Water Resources Management Division plans to inspect all public drinking water systems servicing a population of more than 500 people in the province.

Level I

The components of the first level of the MBSAP protect drinking water from the source to the tap.

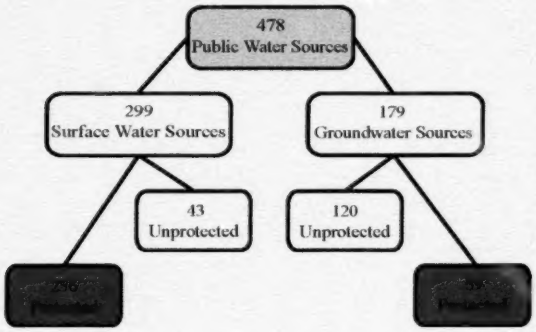
The three components of Level I of the MBSAP are:

1. source water protection
2. drinking water treatment
3. drinking water distribution

Source Water Protection

Protected public water supply areas (PPWSA) are protected under section 39 of the *Water Resources Act*. These PPWSAs service a population of 373,796, representing 92% of the population serviced by public drinking water systems. Figure 2 shows the status of public water sources for fiscal year 2012–13.

Figure 2: Status of Public Water Sources



The Department of Environment and Conservation encourages all communities to begin the protection process for new or existing drinking water sources if they have not already done so.

Watershed Management

The Water Resources Management Division (WRMD) of the Department of Environment and Conservation (ENVC) regulates development activities within protected public water supply areas. WRMD uses a number of tools to monitor such activities, including:

- referrals from the Interdepartmental Land Use Committee (ILUC), Crown Lands, Natural Resources, Municipal and Intergovernmental Affairs and other agencies (Environmental Assessment (EA))
- permits for development
- watershed sensitivity classification system
- watershed management plans
- watershed management committees

Referrals

In the 2012–13 fiscal year, the WRMD processed 236 referrals from various departments for proposed activities concerning PPWSAs as outlined in Table 1.

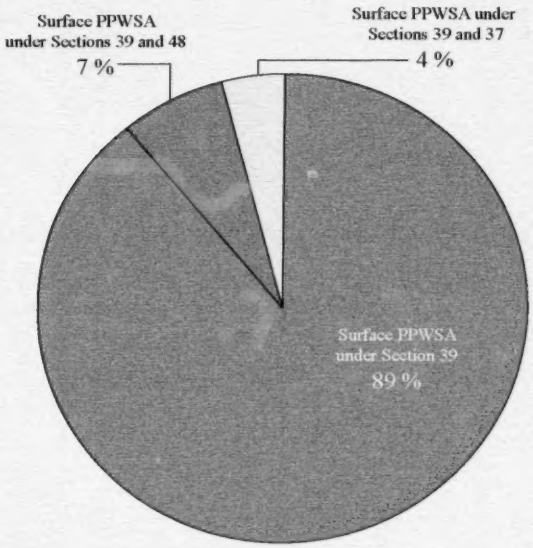
Table 1: Number of Referrals Processed

Type of Referral	Count
Crown Land	94
Natural Resources	57
Interdepartmental Land Use Committee	52
Municipal and Intergovernmental Affairs	22
Other	11
Total	236

Activity Permits

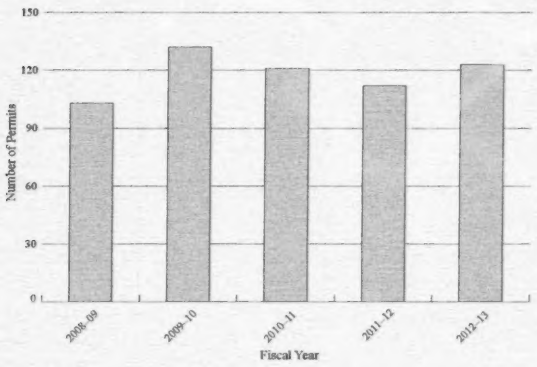
All activities in a PPWSA (either a protected public water supply area, or a wellhead protected water supply area) require a permit. Under the *Water Resources Act* for the 2012–13 fiscal year, 123 development activity permits were issued: Figure 3 illustrates the distribution of development permits by Section. Figure 4 shows the total number of permits issued for development activities within a PPWSA for each fiscal year since 2008–09.

Figure 3: Development Permits by Section



**Section 39 - permits for development in a PPWSA, Section 48 - permits to alter a body of water, Section 37 - permits to construct-waterworks*

Figure 4: Permits Issued per Fiscal Year



Watershed Sensitivity Classification System

The watershed sensitivity classification system was developed to assist the decision making process for development activities within PPWSAs in Newfoundland and Labrador.

The classification system uses a ranking technique that applies a value to various watershed characteristics. Average slope, geographic cover (percentage of watershed covered in forest, water or barrens), and watershed area determine a watershed's potential to be negatively impacted by activities that may impair drinking water quality within a PPWSA. Each characteristic was a weighted numerical value that could be used to calculate an overall score for each PPWSA. Each score is used to rank PPWSAs as low, medium or high sensitivity.

This classification system provides an additional tool to aid WRMD in regulating development activities in PPWSAs, in a consistent method based on their individual characteristics.

Watershed Management Committees

Watershed management committees are formed to oversee land use management, and development and conflict resolution activities inside a PPWSA. Some committees develop watershed management plans (WMP) to oversee the watershed. The active watershed management committees in the province during 2012–13 are located in:

- Clarenville
- Corner Brook (WMP)
- Gander (WMP)
- Grand Falls–Windsor
- Steady Brook (WMP)

Drinking Water Treatment

Several water treatment strategies are used in the province to address the different water quality issues, and provide unique solutions to treat the water before it is consumed.

Disinfection

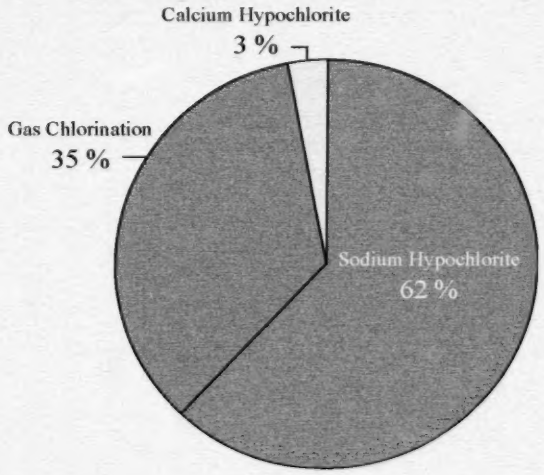
The most critical aspect of water treatment is disinfection. While there are several forms of disinfection used in the treatment of drinking water, chlorination is the most commonly used disinfectant method in the province. The disinfection methods used in the province are outlined in Table 2.

Table 2: Number of Disinfection Systems in Newfoundland and Labrador

Disinfection Systems	Count
Chlorination	465
Ultraviolet Light (UV)	32
Mixed Oxidants (MIOX)	7
Ozone	4
Chloramines	2

Figure 5 illustrates the distribution of different chlorination types in the province during 2012–13.

Figure 5: Chlorination Systems Used in Newfoundland and Labrador



Parameter Specific Drinking Water Treatment

Mitigative measures have been implemented in numerous drinking water systems to alleviate parameter specific water quality challenges. Table 3 shows the number and type of drinking water treatment systems operational in the province as of the 2012–13 fiscal year.

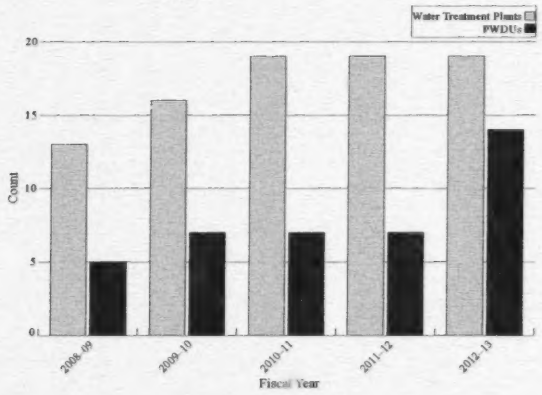
Table 3: Number of Water Treatment Systems in Newfoundland and Labrador

Drinking Water Treatment Systems	Count
pH adjustment	44
Micron/pressure filters	25
Infiltration galleries	23
Arsenic removal	9
Iron/manganese removal	6
Lead removal	1
Strontium removal	1

Water Treatment Plants

As of March 31, 2012, 33 water treatment plants are in place in Newfoundland and Labrador (this number includes 14 potable water dispensing units (PWDUs)). Figure 6 illustrates the total number of water treatment plants in Newfoundland and Labrador for each fiscal year since 2008–09.

Figure 6: Water Treatment Plants per Fiscal Year



Drinking Water Distribution

The drinking water distribution system is the largest component of physical infrastructure that ensures drinking water safety. It includes all the pipes, valves, service lines, pumping stations, fire hydrants, and storage facilities required to deliver clean and safe drinking water.

In the 2012–13 fiscal year there were 522 public water distribution systems in Newfoundland and Labrador. Table 4 shows the breakdown of the number of water distribution systems in the province for 2012–13. Sixty-nine percent of public water distribution systems in Newfoundland and Labrador fall into the "very small" classification, as they serve populations of 500 or fewer people.

Table 4: Public Water Distribution System Classes for 2012–13

Water Distribution System	Population	Count
Very Large	> 50,000	1
Large	15,001- 50,000	2
Medium	1,501 - 15,000	41
Small	501 - 1,500	82
Very Small	≤ 500	360
Unknown	variable	36
Total		522

During the 2012–13 fiscal year, the Department of Municipal and Intergovernmental Affairs approved $30,245,000 for water related projects. Table 5 provides a breakdown of initiatives for the April 1, 2012 to March 31, 2013 fiscal year. The Provincial Government share less GST amounts are shown.

During the 2012–13 fiscal year, the Department of Environment and Conservation issued 174 permits to construct water and sewer infrastructure under Sections 36 & 37 of the *Water Resources Act*. Figure 7 shows the number of permits to construct issued for each fiscal year since 2007–08.

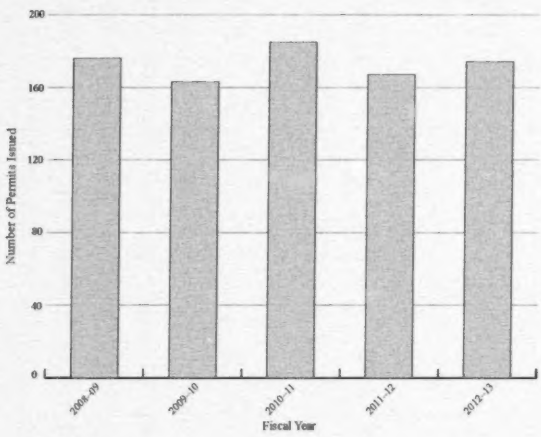
Table 5: Funding Approved by Department of Municipal and Intergovernmental Affairs

Category	*Funding ($)
New Water Distribution	6,250,000
Upgrades to Water Distribution	18,030,000
New Drinking Water Treatment	185,000
Upgrades to Drinking Water Treatment	4,880,000
Studies	500,000
**DWSI/PWDU	400,000
Total	30,245,000

**Provincial share less GST amounts shown*
***Drinking Water Safety Initiative/Potable Water Dispensing Units.*

In the 2012–13 fiscal year, the department issued one permit to operate. The total number of active permits to operate, at the end of the 2012–13 fiscal year were 328, 13 permits to operate water distribution systems and 315 permits to operate water treatment systems.

Figure 7: Number of Permits to Construct per Fiscal Year



Level II

The standard of performance achieved in Level I of the MBSAP is verified through the components of Level II.

The five components in Level II of the MBSAP are:

1. monitoring
2. data management and reporting
3. inspection and enforcement
4. operator education, training, and certification
5. corrective measures

Monitoring

Drinking water quality monitoring consists of regular sampling of drinking water from both the source and the tap. The extensive monitoring program for drinking water quality in the province is a joint responsibility shared by the Department of Environment and Conservation and Service NL.

Bacteriological and Chemical Water Quality

Bacteriological Water Quality

Under the direction of Service NL, Environmental Health Officers collect tap water samples from public drinking water supplies for analysis of bacteriological parameters. The parameters monitored include total coliforms and *Escherichia coli* (*E. coli*). During the 2012–13 fiscal year, 19,121 public water supply bacteriological samples were collected and tested. Figure 8 shows the total number of bacteriological samples that were collected and tested for each fiscal year since 2008–09.

The number of bacteriological samples tested at each public health authority affiliated regional location is shown in Table 6.

Figure 8: Bacteriological Samples Tested per Fiscal Year

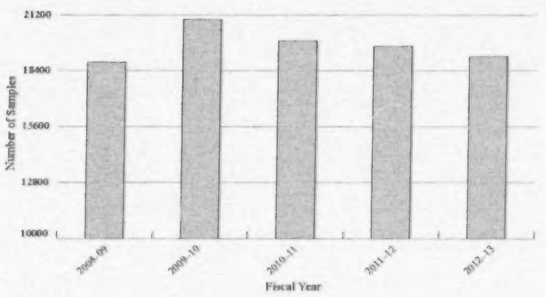


Table 6: Number of Bacteriological Samples Tested in Each Region for 2012–13

Region sampled	Count
St. John's Region	8,225
Western Region	4,214
Central Region	3,703
Northern Region	1,679
Eastern Region	1,300
Total	19,121

Bacteriological Parameters: Results

Based on the analysis of bacteriological parameters for public drinking water samples taken during the 2012–13 fiscal year, 930 public water supply samples tested were found to be unsatisfactory in terms of total coliforms. Table 7 shows the number of samples found to be unsatisfactory for total coliforms, at each public health authority affiliated regional location, for the fiscal year 2012–13.

Table 7: Number of Unsatisfactory Samples for Total Coliforms for 2012–13

Region Tested for Total Coliforms	Samples
St. John's Region	247
Western Region	269
Central Region	246
Northern Region	109
Eastern Region	59
Total	930

Drinking Water Monitoring for Remote Communities

The Water Resources Management Division (WRMD) is committed to drinking water quality monitoring of all public water supplies. Drinking water sampling in remote communities can present a unique challenge. Newfoundland and Labrador has over a dozen remote communities with public water supplies that lack road access.

WRMD staff located in the Western and Labrador regional offices visit remote communities in person as much as possible. The WRMD strives to conduct seasonal trips via helicopter for tap and source water sample collection twice a year. During these visits, WRMD staff are also available to meet with operators or town councils to discuss their drinking water quality concerns.

Unfortunately, WRMD staff are not always able to travel to these remote communities due to scheduling or weather related events that prevent safe access to the area. During the seasons when WRMD staff are unable to visit these communities, WRMD will rely on the communities' operators and town councils for sample collection. Community water supply operators are asked to take the required samples under the direction of WRMD staff.

Coolers are sent to remote communities with all the tools necessary to complete the sampling. The samples are returned to the WRMD regional office for processing and shipment to the contracted laboratory. Communication and guidance between the WRMD, town office employees and water treatment operators is essential during this process to ensure quality control.

Chlorinated water supplies in remote areas are also required to be tested on a monthly basis for bacteriological quality. When not readily accessible by Environmental Health Officers with Service NL, bacteriological samples are also collected by community staff and sent to the Regional Government Service Centre office by scheduled flights. Un-chlorinated water supplies are on a permanent Boil Water Advisory, and are not tested because of the inconsistent results that occur.

WRMD would like to thank each and every remote community system operator that has been requested over the years to collect drinking water samples. The WRMD acknowledges the effort it takes to collect the samples properly and return to the regional offices in due time. Volunteer operators often take their own time to provide this service to their communities. Drinking water sampling for remote communities is one example of how collaboration between provincial and municipal levels of government helps ensure the safety of drinking water for communities in the province.

Community of François, Newfoundland and Labrador

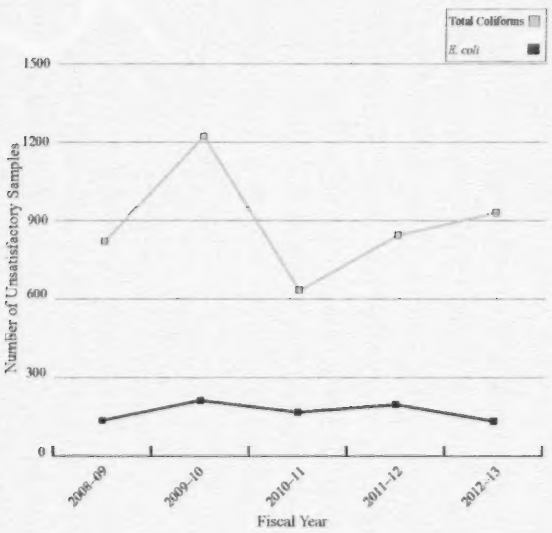
There were 133 bacteriological samples tested that were found to be unsatisfactory in terms of *E. coli**. Table 8 shows the number of samples found to be unsatisfactory for *E. coli.*, at each public health authority affiliated regional location, for the fiscal year 2012–13.

Table 8: Number of Unsatisfactory Samples for *E. coli* for 2012–13

Region Tested for *E. coli*	Unsatisfactory Samples
St. John's Region	63
Western Region	24
Central Region	34
Northern Region	3
Eastern Region	9
Total	133

The number of unsatisfactory samples for total coliforms and *E. coli* for each fiscal year since 2008–09 is shown in Figure 9.

Figure 9: Unsatisfactory Bacteriological Samples per Fiscal Year



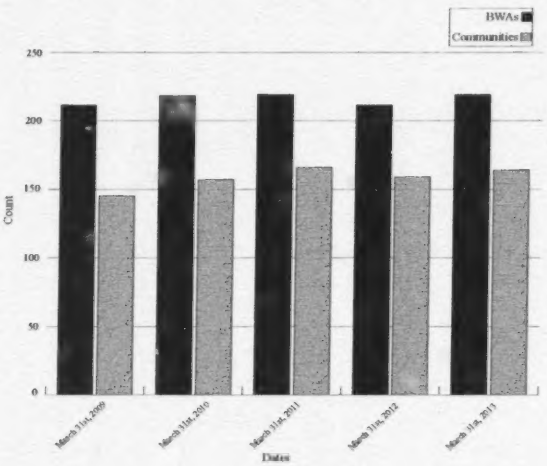
**Escherichia coli (E. coli) is considered a good indicator of recent fecal contamination of drinking water and the possible presence of disease causing microorganisms.*

Boil Water Advisories

Boil water advisories (BWAs) are preventative measures for protecting public health from waterborne microbiological contamination that may, or are known to be, present in drinking water. A BWA is also issued when water quality is questionable due to operational deficiencies (such as inadequate chlorine residual), no disinfection system or the water in a community's water system is contaminated with bacteriological indicators (such as total coliforms).

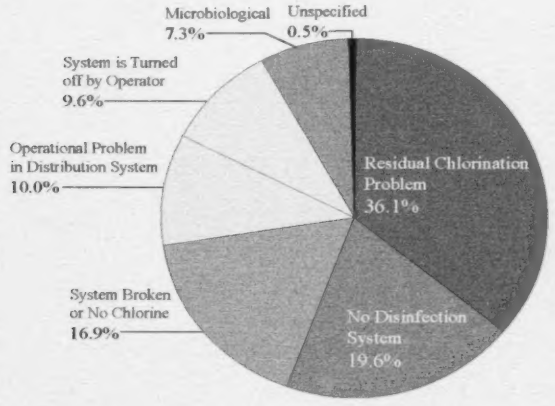
When discussing BWAs for the purpose of this annual report, it is referring to BWAs in effect at the end of the fiscal year, March 31, 2013. Figure 10 shows a historical comparison of BWAs at the end of the fiscal year.

Figure 10: Number of BWAs and Number of Communities Affected



On March 31, 2013, 219 BWAs were in effect (this includes long-term BWAs), affecting 164 communities in the province, with an impacted population of 60,672. Figure 11 illustrates the distribution of existing BWAs by reason used to issue the advisory for the 2012–13 fiscal year.

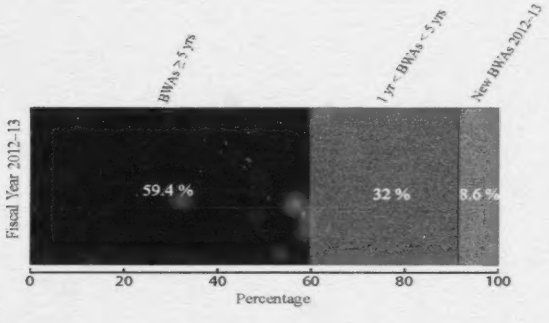
Figure 11: Reasons for BWAs



Long term BWAs are BWAs that have been in effect for a period of five years or greater at the end of the 2012–13 fiscal year. A total of 130 BWAs have been in effect for a period of five years or greater.

Overall there were 302 BWAs issued and 283 BWAs lifted during the 2012–13 fiscal year, which represents 19 new BWAs issued that were not rescinded during the 2012–13 fiscal year. The breakdown of BWAs by duration is illustrated in Figure 12.

Figure 12: Breakdown of Existing BWAs



Chemical and Physical Water Quality

The number of chemical and physical water quality samples taken per region for 2012–13 are presented in Table 9. Analysis of chemical and physical parameters is performed by an accredited lab ensuring that the laboratory provides quality and competency in its sample analysis.

Table 9: Number of Samples Taken by ENVC for 2012–13

Region	Source	Tap	THM	HAA	Total
Eastern	80	441	432	431	1,384
Western	30	347	384	383	1,144
Central	62	213	351	350	976
Labrador	17	57	92	92	258
Other (special)	5	4	4	4	17
Totals	194	1,062	1,263	1,260	3,779

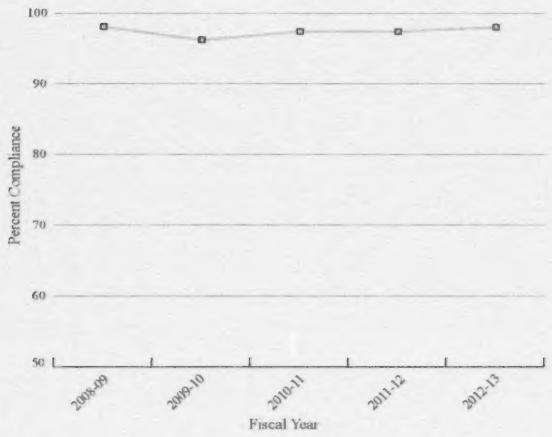
In 2012–13, the Department of Environment and Conservation collected 3,779 samples. Additional samples may also be taken for communities due to community concerns, special monitoring programs or water quality studies for chemical parameters from public water supplies. Ninety-eight percent of the samples that were scheduled for this fiscal year were collected. Table 10 shows the number of samples scheduled and the number actually taken for 2012–13. Figure 13 shows the percent compliance of ENVC's sampling schedule for each fiscal year since 2008–09.

Table 10: Number of Samples Scheduled and Collected by ENVC for 2012–13

Type of Sample	Scheduled	Collected	Percent
Tap Water Sample	1,046	1,062	102*
THM Water Sample	1,296	1,263	97
HAA Water Sample	1,296	1,260	97
Source Water Sample	201	194	97
Total	3,839	3,779	98

** Additional samples taken for special monitoring programs/studies*

Figure 13: Percent Compliance of ENVC's Sampling Schedule per Fiscal Year



The reasons that some samples were not taken are as follows:

- safety (source samples)
- town was not chlorinating at the time of sampling (THM and HAA samples)
- water supply not operating at the time of sampling (tap, THM and HAA samples)
- no sample location available at the time of sampling (very small systems)

Chemical and Physical Parameters: Results

Results for chemical and physical parameters are sent to the Department of Environment and Conservation when laboratory analysis is complete. The department then evaluates the results by comparing them to current *Guidelines for Canadian Drinking Water Quality* (GCDWQ). Water quality results are compared to the GCDWQ to identify exceedances in chemical and physical parameters that may pose a risk to human health or aesthetic approval of drinking water. When an exceedance is confirmed for a parameter that may pose risk to human health, an exceedance report is sent immediately to the community, Departments of Health and Community Services, Municipal and Intergovernmental Affairs and Service NL. Exceedances for aesthetic parameters are also reported to communities, along with all other parameter results, in quarterly drinking water quality reports. Communities and the public can access this drinking water quality data through the WRMD's Water Resources Portal online at: *http://maps.gov.nl.ca/water/*. The WRMD's sampling and reporting procedures are outlined in the *Drinking Water Quality Monitoring Manual*, which can be viewed online at: *http://www.env.gov.nl.ca/env/waterres/quality/drinkingwater/manual.html*.

Table 11 summarizes the tap water bacteriological, chemical and physical parameter exceedances for the 2010–11, 2011–12 and 2012–13 fiscal years.

Data Management and Reporting

The large volume of data acquired during the implementation of the various components of the MBSAP must undergo a stringent quality assurance/quality control (QA/QC) process before it can be compiled, analyzed, and reported to the public. The WRMD strives to collect quality data and report it to the public in an open and timely manner.

As part of ENVC's commitment to report drinking water quality data to the public in an open and timely manner, WRMD distributes a number of reports for communities and the general public. Table 12 summarizes the reports used to communicate the results from programs related to drinking water quality.

Table 11: Exceedances for the 2010–11, 2011–12, and 2012–13 Fiscal Years

Department	Exceedances				
	Parameters		2010–11	2011–12	2012–13
Service NL	Bacteriological	*Escherichia coli*	167	196	133
		Total coliforms	633	844	930
Environment and Conservation	Chemical and Physical	Turbidity	106	98	103
		Arsenic	5	4	4
		Barium	1	2	1
		Fluoride	2	0	1
		Lead	2	8	4
	Disinfection By-Products	Trihalomethanes (THMs)	126	129	132
		Haloacetic Acids (HAAs)	157	165	147
	Aesthetic	Colour	488	514	433
		pH	235	361	335
		Total Dissolved Solids	17	11	17
		Chloride	5	3	6
		Sodium	2	3	4
		Sulphate	4	3	2
		Copper	6	11	1
		Iron	91	107	113
		Manganese	70	83	106

Table 12: Types of Public Reports Produced by ENVC

Type	Description
Seasonal Community Drinking Water Quality Reports	All communities with public water supplies are provided with an interpreted report if seasonal monitoring has been conducted. These reports clearly indicate any parameters that exceed the *Guidelines for Canadian Drinking Water Quality*. The province recommends that communities post these reports in public locations. In the 2012–13 fiscal year, 1,286 seasonal community reports were mailed out.
Exceedance Report	Exceedance reports are provided to communities when a laboratory result is above the *Guidelines for Canadian Drinking Water Quality* for contaminant parameters. These reports are faxed and/or mailed to the affected community as soon as the department receives the results. In the 2012–13 fiscal year, ten exceedance reports were sent out to communities.
Annual Drinking Water Safety in Newfoundland and Labrador Report	The Annual Drinking Water Safety in Newfoundland and Labrador Report has been published each year since 2001. It outlines accomplishments and activities under the Multi-Barrier Strategic Action Plan for drinking water safety in a particular fiscal year
Web Documents on Drinking Water Quality	The WRMD's website is an important tool for communicating with the public. It is updated regularly with new information on drinking water quality and related topics. The "What's New" screen, which lists the most current information, is online at: *http://www.env.gov.nl.ca/env/waterres/whatsnew/index.html*

Inspection and Enforcement

The *Water Resources Act* states that a permit holder shall allow inspectors to carry out inspections of an activity for which a license or permit has been issued. Investigations can also occur once the Department of Environment and Conservation is made aware of a contravention of the *Water Resources Act* or associated regulations and permits. Departmental staff conduct inspections of water supply systems under construction, the operation of water treatment and distribution systems, groundwater wells being drilled, and activities taking place in PPWSAs to ensure that they comply with the terms and conditions of their permit. Communities should conduct routine surveillance and monitoring of approved development activities within PPWSAs to ensure existing development activities are being conducted in an environmentally acceptable manner and to ensure that there are no development activities taking place without prior approval from the department. Investigations are typically issue-specific.

In the 2012–13 fiscal year, departmental staff carried out a total of 75 inspections/ investigations. In addition, staff visited public water supplies two to four times a year during scheduled monitoring work. Table 13 presents a breakdown of inspections for 2012–13.

Table 13: Inspections by ENVC for 2012–13

Inspection Type	Count
Water and Sewer Construction	45
Protected Surface Water Supplies	23
Water System Operation	7
Protected Groundwater Supplies	0
Total	75

One of ENVC's main goals is to ensure communities achieve clean and safe drinking water in a sustainable and efficient manner. When non-compliance with the conditions of a permit is reported, WRMD responds to enforce the permit.

Operator Education, Training, and Certification

Certified operators are integral to the proper operation and maintenance of the systems that supply clean and safe drinking water to the consumer. Through continuing education, training, and certification, the Department of Environment and Conservation is addressing the need for qualified operators of drinking water treatment and distribution systems in this province.

During the 2012–13 fiscal year, 34 drinking water related classroom seminars were held at 14 locations across the province. Two of these courses were taught by external instructors but financed by ENVC.

Operator Training

The operator training program provides municipal drinking water system operators with hands-on training opportunities. The program utilizes three mobile training units (MTUs) that have been equipped with various equipment and tools used in the operation and maintenance of drinking water systems. Training sessions are delivered on-site in the operator's community to maximize accessibility to the training opportunities. During 2012–13, the province's three operator trainers conducted 211 on-site training sessions throughout the province. These sessions were attended by a total of 209 participants, (including 182 municipal operators).

Operator Certification

Certification verifying proper training is an essential component of a safe drinking water system.

There are 376 certified water and/or wastewater operators in Newfoundland and Labrador. Fifty-five operators achieved their first level of certification in the calendar year 2013. Table 14 contains the total number of operator certificates issued per calendar year by classification.

Table 14: Total Number of Operator Certificates Issued per Calendar Year

Calendar Year	2009	2010	2011	2012	2013
Water Distribution	88	80	15	58	19
Water Treatment	3	7	13	26	22
Wastewater Collection	28	15	13	10	24
Wastewater Treatment	1	4	29	1	8
Total Certificates	120	106	70	95	73

Table 15 summarizes the number of communities in Newfoundland and Labrador that employ at least one certified operator by classification.

Table 15: Number of Communities Employing Certified Operators

Certification Classification	Number of Communities
Water Distribution	108
Water Treatment	18
Wastewater Collection	48
Wastewater Treatment	18

Advanced Education Opportunities for Water Treatment Plant Operators

The Operator Education, Training and Certification (OETC) Program was initiated in 2001 under the mandate to provide job-competency based education and training opportunities to operators throughout the province. The program's unique approach minimizes the financial burden on communities to provide their operators with access to training. As a result, participation by municipal operators in the OETC program is quite high.

The training opportunities offered through the OETC program have evolved to meet the training needs of operators. Additional education seminars and on-site training sessions have been added to the curriculum. Despite these additional efforts, the program recognized there was a need for advanced specialty courses for operators that had attained a high level of knowledge.

In February 2013, the department sponsored a Water Treatment Level 3 and 4 Exam Preparation course that was delivered by LEXICON Environmental Consulting Services Inc. Ten water treatment plant operators from communities across the province participated in this course. The feedback from the participants was very positive, and those in attendance gained a lot of knowledge regarding proper operation and maintenance of water treatment facilities, as well as preparation for their advanced level certification exams.

The department is committed to improving the services provided by the OETC program and will continue to organize and deliver continuing education courses as the needs are identified.

Annual Clean and Safe Drinking Water Workshop

The Annual Clean and Safe Drinking Water Workshop is open to all community operators and administrators. It brings together drinking water quality stakeholders and provides them with opportunities to learn about drinking water safety, to exchange information, and to share experiences. The presentations delivered during this event are carefully chosen to address specific challenges faced by small communities in providing clean and safe drinking water.

The 2013 Clean and Safe Drinking Water Workshop took place on March 26, 27 and 28, 2013 in Gander. The workshop attracted 322 participants from across the province and country. Communities from the island portion of the province that were approved for the subsidy were reimbursed up to $400, and communities from Labrador that were approved for the subsidy were reimbursed up to $700. The next Annual Clean and Safe Drinking Water Workshop is scheduled for March 25 - 27, 2014.

Corrective Measures

The Level II components of the MBSAP just discussed, provide an ongoing picture of drinking water supply, quality, and infrastructure. The issues identified require the implementation of corrective actions to deal with these issues. Corrective measures can include structural, non-structural, or operational techniques and other best management practices.

There are five classes of corrective measures: policy, design, water system management, water treatment alternatives, and source alternatives. Table 16 shows the progress made in each category of corrective measures

Table 16: Corrective Measures Undertaken for 2012–13

Corrective Measure	Description
Policy	• Year 12 of the Multi-Barrier Strategic Action Plan for Safe Drinking Water in NL • Sustainable Options for the Management of Public Drinking Water Systems: 2nd Report • The Interdepartmental Safe Drinking Water Technical Working Group met 3 times
Design	• Review and update of the *Newfoundland and Labrador Guidelines for the Design, Construction and Operation of Water and Sewerage Systems* underway
Water System Management	• Ongoing operator education, training and certification • Permits to Construct issued relating to water system management o Water main upgrades and replacement– 28 o New or upgraded pumps– 7 o New tanks or upgrades to tanks– 4 o New contact tanks or pipe– 3 o New or upgraded valves– 8 o New or upgraded flow meter– 9 o New or upgraded SCADA system– 2 o New water quality meters– 2 o New hydrants/flush lines– 2 o Pigging or cleaning of pipe– 2 • One community assessment undertaken in response to drinking water quality issues • Four Permit to Operate Drinking Water Inspection Reports and Inspection Risk Ratings
Water Treatment Alternatives	• Permits to Construct issued relating to water treatment o New chlorination systems– 4 o Chlorination system upgrades– 9 o New UV system– 1 o New filtration systems– 3 o New PWDUs– 6 o New water treatment plant– 1 o Water treatment plant upgrades– 1 • Study on NL water treatment facilities underway
Source Alternatives	• Permits to Construct issued relating to water sources o Upgraded wells– 2 o New wells– 2 o New or upgraded intakes– 6 • Fifty-five public wellhead inspections undertaken

2013 Operator of the Year Awards

The Department of Environment and Conservation created the Operator of the Year Awards to recognize the outstanding dedication of municipal operators in providing clean and safe drinking water. Community representatives across the province were invited to nominate an operator they felt had made an outstanding contribution. In total, 33 nominations were submitted to the selection committee for consideration in two categories: Volunteer Operator of the Year and Operator of the Year.

The Volunteer Operator of the Year Award was created to honour an individual that operates a municipal drinking water system without any monetary compensation. The 2013 Award was presented to Mr. Dave Hart from the Town of Campbellton. Mr. Hart has been a volunteer with the community for seven years and has gone above and beyond to ensure the residents of Campbellton have had a safe and continuous supply of drinking water. His dedication to the residents of Campbellton has not gone unnoticed and the town believes he is very deserving of the Volunteer Operator of the Year Award.

The 2013 Operator of the Year Award was presented to Mr. Paul Hennessey, Town Foreman for the Town of Victoria. Mr. Hennessey has been responsible for operating the town's drinking water systems since 2005. Since that time, he has achieved his Class I Water Distribution Certification and Class I Wastewater Treatment Certification. Mr. Hennessey realizes the importance of providing clean and safe drinking water and is dedicated to ensuring this for the residents of Victoria. It was with pleasure and respect that the Town of Victoria nominated Paul Hennessey for the Operator of the Year Award.

Assistant Deputy Minister of ENVC with the 2013 Volunteer Operator of the Year recipient, Mr. Dave Hart

Assistant Deputy Minister of ENVC with the 2013 Operator of the Year recipient, Mr. Paul Hennessey

Level III

The management of drinking water depends on the contribution of several levels of government as well as the public.

The four components in Level III of the MBSAP are:

1. legislative and policy frameworks
2. public involvement and awareness
3. guidelines, standards and objectives
4. research and development

Legislative and Policy Frameworks

The legislation that governs public drinking water systems in the province includes the *Water Resources Act*, the *Municipal Affairs Act*, and the *Municipalities Act*. All of the legislation, policy directives, standards, and regulations are posted on the province's website. These three Acts contain broadly stated initiatives:

- the *Water Resources Act* regulates the administration of water rights, the protection of public water supply areas, and a range of construction and development permits pertaining to drinking water infrastructure and development that may impact public water supplies
- the *Municipal Affairs Act* administers the management of waterworks
- the *Municipalities Act* grants powers to municipalities for the construction, operation, and maintenance of water systems and for the allocation of funds for this work

Government also introduces regulation, guidelines and policy directives to provide more explicit direction for legislation.

Interdepartmental Cooperation

The Provincial Government's efforts to provide clean and safe drinking water are the result of the combined contributions of four departments: the Department of Environment and Conservation (acting as the lead agency), Health and Community Services, Municipal and Intergovernmental Affairs, and Service NL. Each department is responsible for one or more components of the MBSAP. Their efforts are coordinated by an interdepartmental committee of deputy ministers, which is chaired by the Deputy Minister of the Department of Environment and Conservation. The committee's work is supported by the Interdepartmental Safe Drinking Water Technical Working Group, which was formed in June 2000. The working group is chaired by the Department of Environment and Conservation, and includes representatives from the Departments of Health and Community Services, Municipal and Intergovernmental Affairs, and Service NL. Medical Officers of Health and representatives from the Public Health Laboratory are also members of the working group. The working group met three times in 2012–13, with all activities reported to senior government officials. The working group leads work on the development of policy and guidelines relating to drinking water safety.

In 2012–13, the working group focused on the QA/QC of BWAs, and the implementation of the MBSAP for drinking water safety in Newfoundland and Labrador.

Public Involvement and Awareness

The Department of Environment and Conservation continues to provide accessible and timely drinking water quality information to the public. The department's

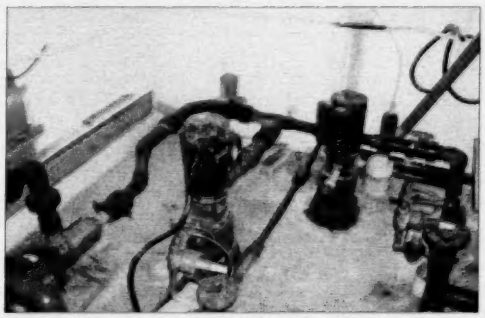
Training Improves Service to Community

Jackson's Cove-Langdon's Cove-Silverdale is a small community located in the central region of Newfoundland and Labrador. It is operated as a Local Service District (LSD) and has a modest population of approximately 150 people. The town has limited resources for operation, maintenance and upgrading of their drinking water system. Recently with the help of the provincial government, the LSD has been able to make some upgrades to their water distribution system. The installation of a six inch PVC waterline connecting Silverdale to Jackson's Cove has enabled the LSD to eliminate two active wells and supply both areas from a single pumphouse. This upgrade however, put extra demand on a very old pumping system.

The operator was concerned about the aging pumping system and the extra demand that was put on it. WRMD staff, who have been providing training to the lead operator, made a visit to the pump house. The staff realized that one of the training curriculums offered by the Operator Education, Training and Certification (OETC) program could be beneficial to the community, and would greatly increase equipment life, cut costs and improve operating pressure to the consumers.

The Nicky's Nose Cove pump house includes two centrifugal pumps, a hypochlorination system and a flow meter. Located between the pumps and the chlorine injection fitting was a water line containing a pressure relief valve (PRV) leading back to the reservoir. The PRV valve in the return line was stuck in an open position creating a continuous open loop where the pumps were continuously recirculating water back into the pond, in addition to feeding the system demand. This led to increased electrical costs, increased wear on the pumping system, and reduced pressure in the distribution system. The OETC Trainer explained the function of the valve for pressure relief protection, and also provided direction to the operator on how to disassemble and repair the valve. The operator then adjusted the pilot control on the valve to 20 psi above the operating pressure and the operation of the valve was tested satisfactorily. The unnecessary water recirculation was eliminated.

There is now less demand on an already aging system, and the potential for chlorinated water to be returned to the reservoir has been eliminated. OETC training led to decreased costs and improved system pressure for the community.



Nicky's Nose Cove pump house, Jackson's Cove-Langdon's Cove-Silverdale

website is a major tool for increasing public awareness and encouraging public involvement. Watershed management committees are another way the public can participate in efforts to ensure clean and safe drinking water supplies. They are excellent forums in which stakeholders can voice opinions and concerns about land management and water quality issues in their watershed areas. The establishment of watershed management committees furthers the Department of Environment and Conservation's goal of increasing public involvement and awareness of drinking water safety issues.

Videos for the following drinking water related topics can be found on YouTube at *http://www.youtube.com/user/NLWaterResources/feed*:

- A video addressing common questions relating to Permits to Construct water and sewer infrastructure in Newfoundland and Labrador
- A video explaining how to find information on public drinking water systems in Newfoundland and Labrador

Guidelines, Standards, and Objectives

To ensure clean and safe drinking water, the Department of Environment and Conservation sets drinking water safety guidelines, standards, and objectives, and regularly reviews and updates them to address current issues and challenges. Guidelines, standards and objectives currently available on our website, *http://www.env.gov.nl.ca/env/waterres/regulations/index.html*, include:

- *Bacteriological Quality of Drinking Water*
- *Standards for Chemical and Physical Monitoring*
- *Guidelines for the Design, Construction and Operation of Water and Sewerage Systems*
- *Chlorination Equipment Selection Guidelines*
- *Best Management Practices for the Control of Disinfection by-Products in Drinking Water Systems in Newfoundland and Labrador*
- *Guidelines for Disinfecting Dug and Drilled Wells*
- *Guidelines for Sealing Groundwater Wells*
- *Selection Criteria and Guidelines for the Design, Construction and Operation of Potable Water Dispensing Units*

Research and Development

In order to stay on top of current and emerging issues that affect drinking water safety, the Department of Environment and Conservation undertakes several research and development activities each year.

The development of the Watershed Sensitivity Classification System was completed during the 2012–13 fiscal year.

The Path Forward

Department of Environment and Conservation

The Department of Environment and Conservation will continue to pursue its commitment to develop and strengthen all levels and components of the Multi-Barrier Strategic Action Plan.

The department's drinking water monitoring activities for the 2013–14 fiscal year are planned as follows: 3,979 drinking water quality samples scheduled for collection and analysis.

- 230 source water samples, which will be analyzed for inorganic chemical parameters
- 1,077 tap water samples, which will be analyzed for inorganic chemical parameters
- 1,336 tap water samples, which will be analyzed for trihalomethanes
- 1,336 tap water samples, which will be analyzed for haloacetic acids

The department will continue to provide education and hands-on training opportunities to water system operators. The 2014 Clean and Safe Drinking Water Workshop is scheduled for March 25 - 27, 2014 in Gander. The department looks forward to sharing information and experiences with the various stakeholders involved in providing clean and safe drinking water to the people of the province.

Department of Health and Community Services

Through the Newfoundland and Labrador Public Health Laboratory and regional drinking water testing locations, water samples from municipal and private supplies are tested for the bacteriological indicators *E. coli* and total coliform bacteria.

In 2013–14 the Department of Health and Community Services and the four Regional Health Authorities will continue with their drinking water safety initiatives by working collaboratively with provincial and municipal partners to maintain, and enhance where possible, drinking water related health protection efforts and disease prevention initiatives.

Key areas of focus are to:

- Provide policy and technical support to Environmental Health Officers with Service NL who perform bacteriological water quality monitoring, interpret bacteriological water quality test results and issue boil water advisories.
- Review boil water advisory guidelines, and revise where necessary.
- Review drinking water safety promotional materials, and revise where necessary.
- Drinking water awareness information is available online at: *http://www.health.gov.nl.ca/health/publichealth/envhealth/drinkingwater.html*
- Provide health-related advice to municipal leaders and residents when unsatisfactory water quality in public water supplies is identified.

Department of Municipal and Intergovernmental Affairs

The Department of Municipal and Intergovernmental Affairs will continue to financially support requests from communities for the provision of water related infrastructure as well as provide implementation oversight. Cost effective approaches with regard to regionalization of operational and maintenance services also will

be encouraged in the way of both advisory and financial support. Appropriate water treatment technology to enable communities to meet the *Guidelines for Canadian Drinking Water Quality* continues to be a priority for capital funding assistance. In this regard, the department is involved in the province's Drinking Water Safety Initiative. This initiative outlines several options to improve drinking water safety based on a comprehensive evaluation of public water supplies in the province. A significant component of this initiative includes the installation of Potable Water Dispensing Units. These water kiosks are small scale water treatment systems designed to provide high-quality drinking water to residents of small, rural, and remote communities otherwise unable to afford full-scale water treatment. Under the initiative this year, seven systems were put in operation and construction progressed on five other systems.

Service NL

Through its bacteriological water monitoring program, Service NL helps ensure that public drinking water is protected from waterborne diseases and is safe for consumption. It's ongoing high level of public water sample collection is an indication of the Department's commitment to a satisfactory level of bacteriological water monitoring and compliance with levels recommended in the province's standards and the *Guidelines for Canadian Drinking Water Quality*.

The Department's six Environmental Technicians are front-line staff with a primary role in the collection and submission of municipal water samples. Environmental Health Officers undertake the essential interpretation of the test results and notification of any issues regarding adverse reports to communities. These efforts are key in helping to secure the safety of the province's public drinking water supplies.

Service NL will also continue to partner with the Department of Health and Community Services and the Regional Health Authorities on water quality issues. It is important to ensure that Environmental Health Officers have access to on-going professional development, including bacteriological water monitoring. Support for professional development in this area will continue.

Weblinks:

Department of Environment and Conservation
http://www.env.gov.nl.ca/env/index.html

Newfoundland and Labrador *Water Resources Act* SNL 2002 cW-4.01
http://www.assembly.nl.ca/Legislation/sr/statutes/w04-01.htm

Water Resources Management Division Reports and Publications
http://www.env.gov.nl.ca/env/waterres/reports/index.html

Newfoundland and Labrador Water Resources Portal
http://maps.gov.nl.ca/water/

Protected Water Supply Area List and GIS Layers
http://www.env.gov.nl.ca/env/waterres/gis/index.html

Guidelines for Canadian Drinking Water Quality: Summary Table
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2012-sum_guide-res_recom/index-eng.php

Standards for Bacteriological Quality of Drinking Water
http://www.env.gov.nl.ca/env/waterres/regulations/policies/standards_microbiological.html

Standards for Chemical and Physical Monitoring of Drinking Water
http://www.env.gov.nl.ca/env/waterres/regulations/policies/physical_monitoring.html

Policy for Drinking Water Quality Monitoring and Reporting for Public Water Supplies
http://www.env.gov.nl.ca/env/waterres/regulations/policies/water_quality.html

Department of Environment and Conservation Drinking Water Quality Data
http://www.env.gov.nl.ca/env/waterres/quality/drinkingwater/chemical.html

Acts, Regulations, Policy Directives, and Water Quality Standards
http://www.env.gov.nl.ca/env/waterres/regulations/policies/index.html

Operator Education, Training, and Certification
http://www.env.gov.nl.ca/env/waterres/training/index.html

Guidelines for the Design, Construction, and Operation of Water and Sewerage Systems
http://www.env.gov.nl.ca/env/waterres/waste/groundwater/report.html

Best Management Practices for the Control of Disinfection By-products in Drinking Water Systems in Newfoundland and Labrador
http://www.env.gov.nl.ca/env/waterres/reports/cwws/index.html

Environment and Conservation

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